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Radio Device with Remote Control

This invention relates to a radio device with a plurality of adjustable transmitting and receiving functions suitable for transmitting information in a complex wireless transmission system, e.g., in the shortwave range.

It is known that stationary radio devices or radio devices installed in motor vehicles can be operated as shortwave transmitting and receiving devices by using remote control devices positioned locally a few meters away or at a greater distance, whereby the status of these radio devices can be monitored and the transmissions/reception information transmitted by these remote control devices. Therefore, a suitable interface for a cable connection between a radio device and a remote control device is provided on the radio device.

In wireless transmission systems which operate with such remote control devices, there is an increasing demand for free mobility of the user in space or over land without being tied to the radio device by cables or the like. This demand is encountered in particular with highly mobile applications such tactical military campaigns or other spontaneous actions such as rescue and emergency actions.

In the field of telephones, it is known that with so-called cordless telephones, for example, a hand-held device can be connected by wireless link to a mobile base unit (German Patent No. 4,237,395). Not only speech information but also program parameters for the base unit can be transmitted over these wireless links. Thus, for example, control commands can be transmitted to an electrical appliance such as a washing machine, or status information can be obtained from such an electric appliance by providing the appliance with such a transmitting and receiving device connected to a central telephone system (European Patent No. 800,303). However, this arrangement, which was developed for telephone systems, is unable to meet the high demands

made of radio devices having a plurality of complex operating functions, especially since information must also be transmitted with the radio devices at the same time.

Therefore, the object of the present invention is to provide a system with which the above-mentioned demand for free mobility of the user can also be met with such wireless transmission systems where high demands are made of the operating functions.

On the basis of a radio device according to the definition of the species of the main claim, this object is achieved by the characterizing features of that claim. Advantageous refinements are derived from the subordinate claims.

According to this invention, a known wireless link is used for transmitting the operating functions as well as transmitting information between a remote control device and the actual radio device, but this wireless link also has appropriate protective measures to ensure error-free transmission. Thus, such a radio device which has a plurality of complex operating functions and is used for information transmission in a complex wireless transmission system such as a shortwave transmission system can also be remotely controlled and remotely monitored by the user, while the user can nevertheless move freely in space or over land.

With the system according to this invention, the mobile remote control device is connected directly to the radio device instead of being connected by way of an intermediate central telephone exchange, as is the case with the known cordless telephone systems (European Patent No. 800,303), so this system is also extremely reliable in operation and cannot be paralyzed by failure of the central exchange.

The additional protective measures in wireless transmission ensure that unauthorized persons cannot intervene in the operating and information transmission system. The measure according to this invention is suitable for transmitting speech as well as other information, possibly even in a time-division multiplex method. With the radio device according to this invention, the actual complex devices for setting the transmission and reception functions and for establishing the

connection remain in the actual radio device, and only the operating and monitoring commands together with the speech information or data information are exchanged over the remote control wireless link.

With respect to the choice of the transmission frequency, the power, the coding (if used) and the data rate, the remote control wireless link is designed to permit secure transmission over a distance of several hundred meters, so that the security of the transmission is not significantly inferior to that required for the system as a whole. This is achieved, for example, by using a suitable power ...

There follows the original description, pages 3 and 4.

This invention is explained in greater detail below with reference to a schematic diagram based on one embodiment.

The figure shows a conventional stationary or semi-mobile radio device 1 which has a plurality of complex functions and is suitable for transmitting information in a complex wireless transmission system, e.g., a shortwave transmission system. An interface 2 for a wireless connection over a remote control wireless link 3 is provided on radio device 1; by means of which radio device 1 has a wireless connection to a locally positioned remote control device over this wireless link. The transmission frequency of this wireless link 3 is adjusted to the operational scenario and may be selected between a shortwave connection and an optical light (infrared) connection. Remote control device 4 is battery powered, has a display field for the operating functions of radio device 1 and a corresponding operating field with which the user can set the individual operating functions of the radio device. In addition, a status display of the radio device in the display field is also possible. In addition, an interface 5 for input and output of the information to be transmitted over the radio device is also provided, said information being, for example, speech or other digital data. Thus, not only is the locally positioned radio device 1 operated and monitored over wireless link 3 but also the actual transmission of information to hand-held device 4 take place over this wireless link.

Additional protective measures to ensure error-free transmission of operating data and information data are also provided on wireless link 3. Wireless link 3 is equipped with suitable channel coding, for example, and data transmission is handled according to a known transmission protocol. In addition, measures for encoding and decoding the transmitted data may be provided to prevent unauthorized persons from penetrating the transmission link. In addition, measures to protect against outside interference may be provided, e.g., through a suitable signal spread (use of a suitable method of sudden frequency change or other coding measures).

If radio device 1 already has a remote control device 6 which is connected by a cable 7 to the

actual radio device 1, a suitable interface 2 may also be provided on a corresponding remote control device 6, so that a wireless remote control link 3 to this locally positioned remote control device 4 can be established, and again in this case, input and output of information to be transmitted over radio device 1 may also be provided by way of an interface 5. Thus, not only remote control data and remote monitoring data but also information can be transmitted over wireless link 3.